REMARKS

After entry of the present amendment, claims 1-7 and 9-25 are pending. Claims 2, 11-13, and 15-21 are withdrawn, and claim 8 is canceled. Support for the current amendment can be found at least in the second paragraph on page 43 of the present description. Claims 1, 3-4, 9-10, and 14 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over US 2004/0266939 A1 ("Chen") and further in view of JP 2002-140930 ("Mitsubishi '930") or JP 2000-219739 ("Mitsubishi '739"). Claims 1, 3-5, 9-10, 14, and 22-25 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over US 2004/0021131 A1 ("Blanchet-Fincher") and further in view of Mitsubishi '930 or Mitsubishi '739. Claims 1, 3-5, 9-10, 14, and 22-25 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over US 2003/0122111 A1 ("Glatkowski") and further in view of Mitsubishi '930 or Mitsubishi '739. Claims 1, 3-4, 9-10, 14, and 22-25 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over WO 03/013199 A1 ("Eikos") and further in view of Mitsubishi '930 or Mitsubishi '739. Claim 6 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Glatkowski, Eikos, Blanchet-Fincher, or Chen in view of Mitsubishi '930 or Mitsubishi '739 as applied to claim 1 and further in view of Eikos and Search Report (Nguyen). Claim 7 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Glatkowski, Eikos, Blanchet-Fincher, or Chen in view of Mitsubishi '930 or Mitsubishi '739 as applied to claim 1, and further in view of US 2004/0206942 A1 ("Hsu"). Applicant respectfully requests reconsideration and allowance in view of the amendments and discussion presented herein.

Claims 1, 3-4, 9-10, and 14 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Chen and further in view of Mitsubishi '930 or Mitsubishi '739

The Office Action suggests that the Chen reference discloses a composition with nanotubes and a conductive polymer such as polypyrrole, which is soluble in water and a solvent. The Office Action further suggests that the Mitsubishi '739 reference discloses a

composition with a water-soluble conducting formula and a basic compound and the Mitsubishi '930 reference discloses a composition with a water-soluble conducting polymer, a high molecular weight component, a surfactant and a basic compound.

The conducting polymer used in claim 58 of the Chen reference comprises a backbone portion selected from a group containing poly(aryleneethynylene), poly(phenyleneethynylene), poly(3-decylthiophene), and polypyrrole. The Applicant respectfully points out that when these molecules are in a solvent, they are in dedoped conditions and they do not have conductivity. Additionally, when they are doped, they are not dissolved in a solvent. Therefore, when the polymer is mixed with carbon nanotubes in a solvent, the polymer which does not have conductivity is adhered on the surface of the carbon nanotubes. Resultantly, the carbon nanotubes cannot exert inherent conductivity.

In contrast, the water-soluble conducting polymer in the present invention has an acidic group which functions as a dopant. Solubility to solvents is improved due to the acidic group, particularly in water or water-containing organic solvents. In addition, the conducting polymer in the solvent is in doped conditions, which is necessary to conductivity. When the water-soluble conducting polymer having an acidic group is contacted with the carbon nanotubes in water or a water-containing organic solvent, the carbon nanotubes can be dispersed or dissolved therein. This is achieved only by having both water-solubility and conductivity. While not wishing to be limited by this theory, the carbon nanotubes are presumed to be dispersed or solubilized together with the conducting polymer due to mutual adsorption by the conducting polymer and the carbon nanotubes, due to the π-π interaction by π electrons (as disclosed in the present description, page 3, fourth paragraph). Moreover, the Applicant has found that when carbon nanotubes are dispersed in a solvent and a conducting polymer is merely dispersed or dissolved in the solvent, the carbon nanotubes cannot exert their inherent conductivity. In order to resolve this problem, the present invention uses a specific conducting polymer which can both exert conductivity and improve the dispersibility of the carbon nanotubes.

The Mitsubishi '739 and Mitsubishi '930 references fail to recognize the problem caused by combining carbon nanotubes and a water-soluble conducting polymer; as a result, the proposed combination fails to disclose or suggest the specific carbon nanotube composition. As the Chen, Mitsubishi '739, and Mitsubishi '930 references, neither alone nor in combination teach nor suggest the above described specific conducting polymer, the Applicant believes that the present invention is not obvious in view of these references.

Claims 1, 3-5, 9-10, 14, and 22-25 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Blanchet-Fincher and further in view of Mitsubishi '930 or Mitsubishi '739

The Blanchet-Pincher reference discloses a composition containing carbon nanotubes, a conducting polymer, such as polyaniline, polythiophene, and polypyrrole, and a solvent. In addition, the conducting polymer is doped with an organic acid, such as dinonylnaphthalene sulfonic acid [0073], dodecylbenzene sulfonic acid [0060]. However, the solubility of the conducting polymer would be inferior in relation to the present invention because the conducting polymer is doped. Furthermore, in order to improve the dispersibility of the carbon nanotubes, the Blanchet-Fincher reference uses a surfactant agent. However, the dispersibility of the carbon nanotubes in the composition containing the surfactant agent is insufficient.

In contrast, the conducting polymer used in the present invention has an acidic group in its molecular structure, which functions as a dopant. Therefore, it is not necessary to perform a dope treatment for the conducting polymer by adding an organic acid. In Example 8 of the present invention, polyaniline is used as the water-soluble conducting polymer. When polyaniline is doped, the doped polyaniline is insoluble in a solvent. To resolve this problem, in production Example 4 the doped polyaniline is subjected to an ammonia treatment to be dedoped. Due to this treatment, the dedoped polyaniline can be dissolved in a solvent, and mixed with the carbon nanotubes. When the composition obtained

is evaluated, the film formed by using the composition is subjected to an acid treatment after forming a film. As explained above, when polyaniline is used, it is necessary to perform a dedope treatment or an acid treatment. In contrast, sufficient conductivity can be achieved without these treatments, because the water-soluble conducting polymer having an acidic group is used in the present invention.

As explained above, the Mitsubishi '739 and Mitsubishi '930 references fail to recognize the problem caused by combining carbon nanotubes and a water-soluble conducting polymer; as a result, the proposed combination fails to disclose or suggest the specific carbon nanotube composition. Furthermore, improvement of the conductivity of the water soluble polymer is not disclosed. As the Blanchet-Pincher, Mitsubishi '739, and Mitsubishi '930 references, neither alone nor in combination teach nor suggest the above described specific conducting polymer, the Applicant believes that the present invention is not obvious in view of these references.

Claims 1, 3-5, 9-10, 14, and 22-25 stand rejected under 35 U.S.C. § 103(a) as being unpatentable Glatkowski and further in view of Mitsubishi '930 or Mitsubishi '739

The Glatkowski reference discloses a composition containing a polymer, carbon nanotubes, and a solvent. In addition, claim 15 mentions conducting polymers. However, there are no embodiments in the Glatkowski reference of the conducting polymers. While Glatkowski does refer to a polyimide in paragraph [0048], this does not describe the conducting polymer in the Applicant's claims. In addition, there is no teaching as to the dispersibility of the carbon nanotubes. Still more, there are no descriptions about the water-soluble conducting polymer having an acidic group. In contrast to the teaching of the Glatkowski reference, the present invention achieves both excellent solubility or dispersibility and excellent conductivity of the carbon nanotubes by using the specific water-soluble conducting polymer.

As explained above, the Mitsubishi '739 and Mitsubishi '930 references fail to recognize the problem caused by combining carbon nanotubes and a water-soluble conducting polymer; as a result, the proposed combination fails to disclose or suggest the specific carbon nanotube composition. Furthermore, improvement of the conductivity of the water soluble polymer is not disclosed. As the Glatkowski, Mitsubishi '739, and Mitsubishi '930 references, neither alone nor in combination teach nor suggest the above described specific conducting polymer, the Applicant believes that the present invention is not obvious in view of these references.

Claims 1, 3-4, 9-10, 14, and 22-25 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Eikos and further in view of Mitsubishi '930 or Mitsubishi '739

The Eikos reference discloses a conformal coating for EMI shielding comprising an insulating layer and a conducting layer, wherein the conducting layer contains a conducting polymer (claim 13). However, there are no embodiments such as examples in which conducting polymer used. In addition, Eikos does not disclose the specific conducting polymer used in the present invention. Furthermore, there is no teaching as to dispersibility of the carbon nanotubes. Still more, there are no descriptions about the water-soluble conducting polymer having an acidic group. The present invention achieves both excellent solubility or dispersibility and excellent conductivity of the carbon nanotubes by using the specific water-soluble conducting polymer.

As explained above, the Mitsubishi '739 and Mitsubishi '930 references fail to recognize the problem caused by combining carbon nanotubes and a water-soluble conducting polymer; as a result, the proposed combination fails to disclose or suggest the specific carbon nanotube composition. Furthermore, improvement of the conductivity of the water soluble polymer is not disclosed. As the Eikos, Mitsubishi '739, and Mitsubishi '930 references, neither alone nor in combination teach nor suggest the above described specific conducting polymer, the Applicant believes that the present invention is not obvious in view of these references.

Claim 6 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Glatkowski, Eikos, Blanchet-Fincher, or Chen in view of Mitsubishi '930 or Mitsubishi '739 as applied to claim 1 and further in view of Eikos and Search Report (Nguyen)

The Eikos reference on page 19, Table 2, discloses the use of a "Ceromer Coating." However, this is a composite material containing an organic polymer and an inorganic material. The above stated "Ceromer Coating" is not a silane coupling agent as described in claim 6 of the present invention. Moreover, the Eikos reference never discloses nor suggests the remarkable improvement of water resistance of a film obtained by adding a silane coupling agent. Finally, a ceromer coating as applied in the Eikos reference is essentially different from the use of the silane coupling agent in the present invention, specifically as described in Example 14 of the present invention.

Claim 7 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Glatkowski, Eikos, Blanchet-Fincher, or Chen in view of Mitsubishi '930 or Mitsubishi '739 as applied to claim 1, and further in view of Hsu

The Hsu reference, as cited in the Office Action, neither teaches nor suggests the use of colloidal silica. Furthermore, the Hsu reference does not speak to the use of colloidal silica regarding its application for the improvement of surface hardness and weather resistance of the present invention. In any event, even in the event that the above references were combined, they would not have taught the presently claimed invention to a person of ordinary skill in the art.

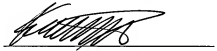
Conclusion

Applicant respectfully requests entry of the present amendment, reconsideration and withdrawal of the rejections to claims 1, 3-7, 9-10, 14 and 22-25, and this application passed to allowance.

The Commissioner is hereby authorized to charge any additional fees which may be required with respect to this communication, or credit any overpayment, to Deposit Account No. 06-1135.

Respectfully submitted,

FITCH, EVEN, TABIN & FLANNERY



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